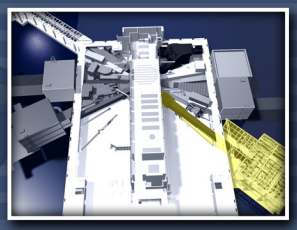
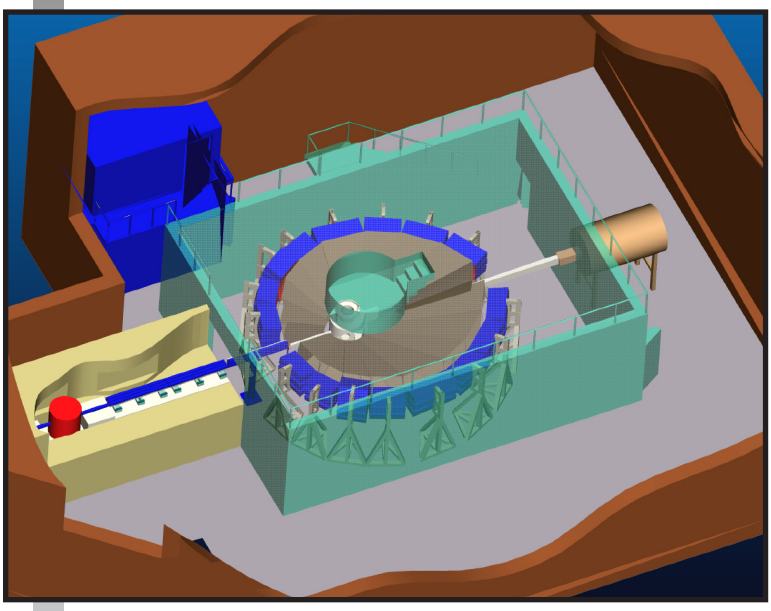
Instrument Fact Sheet

BEAM LINE 11A



POWGEN3 Powder Diffractometer

The POWGEN3 Powder Diffractometer is designed to study polycrystalline materials. It is a versatile diffractometer that enables users to collect typical Rietveld statistics in ~20 minutes from a 0.6cm3 sample with a <0.1% resolution at short d-spacings and <1% resolution for nearly all d-spacings of interest. This is a very standard tool with faster and higher precision than other diffractometers in the U.S. Scientific opportunities exists in both magnetic materials, such as high-Tc superconductors, metal-insulator transitions, charge and orbital ordering transitions, molecular magnets, and others; and non-magnetic materials such as Zeolite and AIPO frameworks, metals and semiconductors, dielectrics, ferroelectrics, and thermoelectrics, pharmaceuticals, and more.



Specifications

Moderator	decoupled poisoned supercritical hydrogen
Source-sample distance	60 m
Sample-detector distance	1 – 6 m
Detector angular coverage	6° < 2θ < 170°
Wavelength bandwidth	~1 Å
Frame 1	0.3 Å < d < 10 Å
Frame 6	3 Å < d < 66 Å
Resolution	0.001 < Δd/d < 0.016
Resolution at 90°	Δd/d = 0.0015

Recent Significant Events:

- The concrete shielding base, primary shutter, collimating shutter insert and bulk shield flange have all been installed.
- The first 40 m of the supermirror neutron guide have been delivered.
- Fabrication of the first two wavelength shifting crossed fiber detector modules has begun.
- Procurements have been placed for all instrument major components; including T0 chopper, three bandwidth choppers, concrete beamline shielding blocks, secondary shutter, sample vacuum chamber, helium filled coarse radial collimator, detector modules and stands, data acquisition system and computers, instrument shielding enclosure and beam stop.
- Instrument commissioning is expected mid-2007.

Future Events:

- Fall 2007: Initial users will arrive for experiments.
- Summer 2007: Power level to exceed 100kW.
- Spring 2008: General User Program opens for POWGEN3

For more information, contact Powder Diffractometer staff

Instrument Scientist: Jason Hodges, hodgesj@sns.gov, (865) 576.7034
Lead Engineer: Robert Whipple, whipplerz@sns.gov, (865) 241.1754
Scientific Associate: Luke Heroux, herouxla@sns.gov, (865) 241.8673

www.sns.gov/users/instrument_systems/instruments/elastic/pow-gen3.shtml

June 2006

05-03082/arm